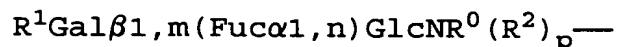


## WHAT IS CLAIMED IS:

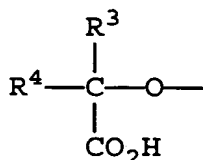
1. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound comprising a moiety which selectively binds a selectin receptor, the moiety having the formula:



in which:

$R^0$  is a member selected from the group consisting of  $(C_1-C_8 \text{ alkyl})\text{carbonyl}$ ,  $(C_1-C_8 \text{ alkoxy})\text{carbonyl}$ , and  $(C_2-C_9 \text{ alkenyloxy})\text{carbonyl}$ ;

$R^1$  is a member selected from the group consisting of an oligosaccharide and a group having the formula



in which:

$R^3$  and  $R^4$  taken individually are the same or different and are selected from the group consisting of H,  $C_1-C_8 \text{ alkyl}$ , hydroxy- $(C_1-C_8 \text{ alkyl})$ , aryl- $(C_1-C_8 \text{ alkyl})$ , and  $(C_1-C_8 \text{ alkoxy})$ - $(C_1-C_8 \text{ alkyl})$ , substituted or unsubstituted, or

$R^3$  and  $R^4$  form a single radical which is a member selected from the group consisting of  $-R^5-$  and  $-(R^6)_q-O-(R^7)_r-$  in which  $R^5$  is  $C_3-C_7$  divalent alkyl, substituted or unsubstituted,  $R^6$  and  $R^7$  are the same or different and are  $C_1-C_6$  divalent alkyl, substituted or unsubstituted, and  $q$  and  $r$  are the same or different and are zero or 1 such that the sum of  $q$  and  $r$  is at least 1; the substitutions in the substituted groups being selected from the group

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consisting of hydroxy, hydroxy(C<sub>1</sub>-C<sub>4</sub> alkyl), polyhydroxy(C<sub>1</sub>-C<sub>4</sub> alkyl), and alkanoamido;

R<sup>2</sup> is a member selected from the group consisting of H, C<sub>1</sub>-C<sub>8</sub> alkyl, hydroxy-(C<sub>1</sub>-C<sub>8</sub> alkyl), aryl-(C<sub>1</sub>-C<sub>8</sub> alkyl), (C<sub>1</sub>-C<sub>8</sub> alkyl)-aryl, alkylthio, α1,2Man, α1,6GalNAc, β1,3Galβ1,4Glc, α1,2Man-R<sup>8</sup>, α1,6GalNAc-R<sup>8</sup>, and β1,3Gal-R<sup>8</sup>,

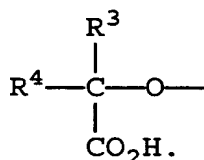
wherein R<sup>8</sup> is a member selected from the group consisting of H, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> alkoxy, hydroxy-(C<sub>1</sub>-C<sub>8</sub> alkyl), aryl-(C<sub>1</sub>-C<sub>8</sub> alkyl), (C<sub>1</sub>-C<sub>8</sub> alkyl)-aryl, and alkylthio;

m is 3 or 4;

n is 3 or 4; and

p is zero or 1.

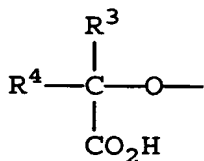
2. The composition of claim 1, wherein R<sup>1</sup> is a member selected from the group consisting of a trisaccharide and the group having the formula



3. The composition of claim 1, wherein R<sup>1</sup> is a trisaccharide.

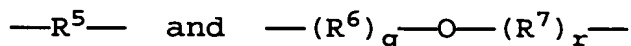
4. The composition of claim 1, wherein R<sup>1</sup> is a trisaccharide selected from the group consisting of NeuAcα2,3Galβ1,4GlcNAcβ1,3 and NeuGcα2,3Galβ1,4GlcNAcβ1,3.

5. The composition of claim 1, wherein R<sup>1</sup> is a group having the formula



2-claim 1, 8/10, 789

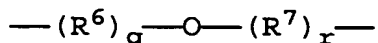
6. The composition of claim 5, wherein  $R^3$  and  $R^4$  form a single radical which is a member selected from the group consisting of



5 in which  $R^5$  is  $C_3-C_7$  divalent alkyl, substituted or unsubstituted,  $R^6$  and  $R^7$  are the same or different and are  $C_1-C_6$  divalent alkyl, substituted or unsubstituted, and  $q$  and  $r$  are the same or different and are zero or 1 such that the sum of  $q$  and  $r$  is at least 1.

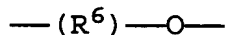
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7. The composition of claim 5, wherein  $R^3$  and  $R^4$  form a single radical having the formula



15 in which  $R^6$  and  $R^7$  are the same or different and are  $C_1-C_6$  divalent alkyl, substituted or unsubstituted, and  $q$  and  $r$  are the same or different and are zero or 1 such that the sum of  $q$  and  $r$  is at least 1.

8. The composition of claim 5, wherein  $R^3$  and  $R^4$  form a single radical having the formula



in which  $R^6$  is  $C_3-C_4$  divalent alkyl, substituted or unsubstituted.

9. The composition of claim 8, wherein  $R^6$  is  $-CH_2-CH_2-CH_2-CH_2-$ , substituted or unsubstituted.

10. The composition of claim 1, wherein the substitutions in the substituted groups are selected from the group consisting of hydroxy, hydroxy( $C_1-C_4$  alkyl), polyhydroxy( $C_1-C_4$  alkyl), and alkanoamido.

11. The composition of claim 10, wherein the substituted groups are selected from the group consisting of hydroxy, polyhydroxy( $C_3$  alkyl) acetamido and hydroxyacetamido.

12. The composition of claim 1, wherein  $R^1$  is a monosaccharide.

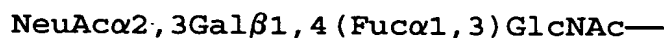
Claims 6-12  
8/2/78

13. The composition of claim 12, wherein  $R^1$  is a sialic acid.

14. The composition of claim 13, wherein the sialic acid is NeuAc $\alpha$ 2,3 or NeuGc $\alpha$ 2,3.

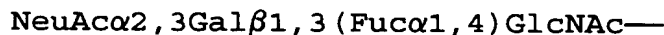
15. The composition of claim 1, wherein m is 4 and n is 3.

16. The composition of claim 15, wherein the moiety has the formula:



17. The composition of claim 1, wherein the m is 3 and n is 4.

18. The composition of claim 17, wherein the moiety has the formula:



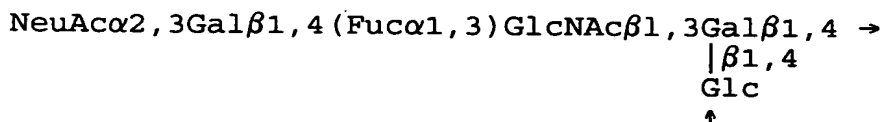
19. The composition of claim 1, wherein p is 1.

20. The composition of claim 19, wherein  $R^2$  is  $\beta 1,3\text{Gal}-R^8$ , and  $R^8$  is  $C_1-C_8$  alkoxy.

21. The composition of claim 1, wherein the compound is a glycoprotein, a glycolipid, or polysaccharide.

22. A composition of claim 1, wherein the compound is a polysaccharide.

23. A composition of claim 22, wherein the polysaccharide comprises a repeat unit having the formula:



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810,789 from

Claims 21-23 of 810,789

$$\text{NeuAc}\alpha 2,3\text{Gal}\beta 1,4(\text{Fuc}\alpha 1,3)\text{GlcNAc}\beta 1,3\text{Gal}\beta 1,4\text{Glc}\beta 1,3\text{Glc}\beta 1,2\rightarrow$$
$$\text{NeuAc}\alpha 2,3\text{Gal}\beta 1,4(\text{Fuc}\alpha 1,3)\text{GlcNAc}\beta 1,3\text{Gal}\beta 1,4 \rightarrow$$

26. A composition of claim 22, wherein the polysaccharide is a fucosylated type Ia polysaccharide of Group B streptococcus.

27. A composition of claim 22, wherein the polysaccharide is a type II or type III polysaccharide of Group B streptococcus.

28. A composition of claim 22, wherein the polysaccharide has molecular weight between about 5,000 and 300,000 daltons.

29. A composition of claim 22, wherein the polysaccharide comprises between about 5 and about 200 fucosylated repeat units.

30. A composition of claim 29, wherein the polysaccharide comprises between about 25 and about 100 fucosylated repeat units.

31. A composition of claim 1, wherein the compound is a sphingolipid.

32. A composition of claim 31, wherein the compound is a ganglioside.

33. A composition of claim 1, wherein the selectin receptor is expressed on a vascular endothelial cell or a platelet.

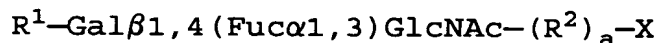
5 34. A composition of claim 33, wherein the selectin receptor is E-Selectin or P-Selectin.

10 ~~35.~~ A pharmaceutical composition which comprises a pharmaceutically acceptable carrier and a liposome having a compound which selectively binds a selectin receptor.

36. A composition of claim 35, wherein the liposome encapsulates an anti-inflammatory chemotherapeutic agent.

15 37. A composition of claim 36, wherein the anti-inflammatory agent is cyclosporin A, indomethacin, naproxen, FK-506, or mycophenolic acid.

20 38. A composition of claim 35, wherein the compound has the formula



wherein  $R^1$  is selected from the group consisting of NeuAc $\alpha$ 2,3, NeuGc $\alpha$ 2,3, NeuAc $\alpha$ 2,3Gal $\beta$ 1,4GlcNAc $\beta$ 1,3, and NeuGc $\alpha$ 2,3Gal $\beta$ 1,4GlcNAc $\beta$ 1,3;

25 wherein  $R^2$  is a member selected from the group consisting of  $\beta$ 1,3Gal,  $\alpha$ 1,2Man,  $\alpha$ 1,6GalNAc,  $\beta$ 1,3Gal $\beta$ 1,4Glc;

wherein  $a$  is 0 or 1;

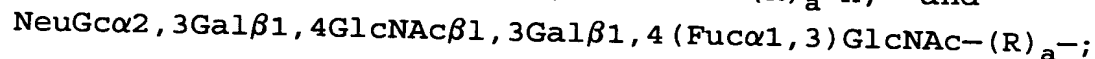
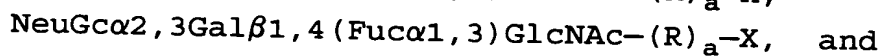
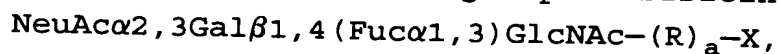
and wherein X is a protein or lipid.

30 39. A composition of claim 38, wherein X is a glycoprotein having a molecular weight between 40,000 and about 250,000 daltons.

35 40. A composition of claim 38, wherein X is a glycolipid having a molecular weight between about 600 and about 4,000 daltons.

Claims 33-46  
810,789

41. A composition of claim 35, wherein the compound has a formula selected from the group consisting of:



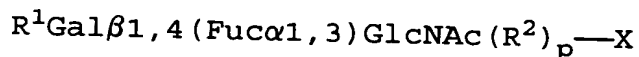
wherein R is a member selected from the group consisting of  $\beta 1,3\text{Gal}$ ,  $\alpha 1,2\text{Man}$ ,  $\alpha 1,6\text{GalNac}$ ,  $\beta 1,3\text{Gal}\beta 1,4\text{Glc}$ ;

wherein a is 0 or 1;

and wherein X is a protein or lipid.

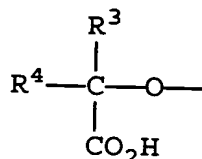
42. A composition of claim 35, wherein the selectin receptor is expressed on a vascular endothelial cell or a platelet.

43. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound which selectively binds a selectin receptor, the compound having the formula:



in which:

$\text{R}^1$  is a member selected from the group consisting of an oligosaccharide and a group having the formula



in which:

$\text{R}^3$  and  $\text{R}^4$  taken individually are the same or different and are selected from the group consisting of H,  $\text{C}_1\text{-C}_8$  alkyl, hydroxy- ( $\text{C}_1\text{-C}_8$  alkyl), aryl- ( $\text{C}_1\text{-C}_8$  alkyl), and ( $\text{C}_1\text{-C}_8$  alkoxy)- ( $\text{C}_1\text{-C}_8$  alkyl), substituted or unsubstituted, or

$\text{R}^3$  and  $\text{R}^4$  form a single radical which is a member selected from the group consisting of

Claims 41-43  
 8105789

—R<sup>5</sup>— and —(R<sup>6</sup>)<sub>q</sub>—O—(R<sup>7</sup>)<sub>r</sub>—  
 in which R<sup>5</sup> is C<sub>3</sub>-C<sub>7</sub> divalent alkyl,  
 substituted or unsubstituted, R<sup>6</sup> and R<sup>7</sup>  
 are the same or different and are C<sub>1</sub>-C<sub>6</sub>  
 divalent alkyl, substituted or  
 unsubstituted, and q and r are the same  
 or different and are zero or 1 such  
 that the sum of q and r is at least 1;  
 the substitutions in the substituted groups  
 being selected from the group  
 consisting of hydroxy, hydroxy(C<sub>1</sub>-C<sub>4</sub>  
 alkyl), polyhydroxy(C<sub>1</sub>-C<sub>4</sub> alkyl), and  
 alkanoamido;

R<sup>2</sup> is a member selected from the group consisting of  
 $\beta$ 1,3Gal,  $\alpha$ 1,2Man,  $\alpha$ 1,6GalNAc and  $\beta$ 1,3Gal $\beta$ 1,4Glc;  
 p is zero or 1; and

X is selected from the group consisting of —H, —OH,  
 —NH<sub>3</sub>, —NHR<sup>8</sup>, —NR<sup>8</sup>R<sup>9</sup>, —OR<sup>8</sup>, —OAr<sub>yl</sub>, —OAlkylAr<sub>yl</sub>,  
 —OAr<sub>yl</sub>Alkyl, —Ar<sub>yl</sub>, —Ar<sub>yl</sub>Alkyl, and —AlkylAr<sub>yl</sub>, wherein R<sup>8</sup>  
 and R<sup>9</sup> are the same or different and are C<sub>1</sub>-C<sub>20</sub> alkyl.

44. A composition of claim 43, wherein the compound  
 has the formula selected from the group consisting of:

NeuAc $\alpha$ 2,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R<sup>2</sup>)<sub>p</sub>,  
 NeuGc $\alpha$ 2,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R<sup>2</sup>)<sub>p</sub>, and  
 NeuGc $\alpha$ 2,3Gal $\beta$ 1,4GlcNAc $\beta$ 1,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)-  
 GlcNAc-(R<sup>2</sup>)<sub>p</sub>;

wherein R<sup>2</sup> is a member selected from the group  
 consisting of  $\beta$ 1,3Gal,  $\alpha$ 1,2Man,  $\alpha$ 1,6GalNAc and  
 $\beta$ 1,3Gal $\beta$ 1,4Glc; and  
 p is zero or 1.

45. A composition of claim 43, wherein the compound  
 has the formula selected from the group consisting of:

NeuAc $\alpha$ 2,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R<sup>2</sup>)<sub>p</sub>,  
 NeuGc $\alpha$ 2,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R<sup>2</sup>)<sub>p</sub>, and  
 NeuGc $\alpha$ 2,3Gal $\beta$ 1,4GlcNAc $\beta$ 1,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)-  
 GlcNAc-(R<sup>2</sup>)<sub>p</sub>;

Class 44 - 8105789

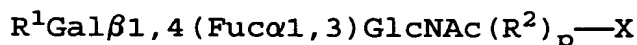
differs from 810-789

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application



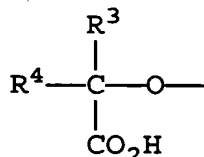
wherein  $R^2$  is  $\beta 1,3\text{Gal}$ ;  
 $X$  is  $-\text{OR}^8$ ; and  
 $p$  is 1.

46. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound having two or more repeat units capable of selectively binding a selectin receptor, the repeat units comprising a selectin-binding moiety and being linked by a linker moiety, each repeat unit having the formula:



in which:

$R^1$  is a member selected from the group consisting of an oligosaccharide and a group having the formula



in which:

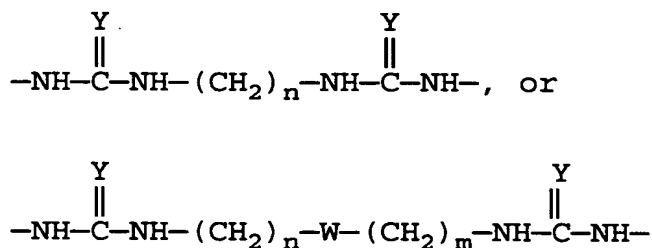
$R^3$  and  $R^4$  taken individually are the same or different and are selected from the group consisting of H,  $C_1-C_8$  alkyl, hydroxy- $(C_1-C_8)$  alkyl, aryl- $(C_1-C_8)$  alkyl, and  $(C_1-C_8)$  alkoxy- $(C_1-C_8)$  alkyl, substituted or unsubstituted, or

$R^3$  and  $R^4$  form a single radical which is a member selected from the group consisting of  $-R^5-$  and  $-(R^6)_q-O-(R^7)_r-$  in which  $R^5$  is  $C_3-C_7$  divalent alkyl, substituted or unsubstituted,  $R^6$  and  $R^7$  are the same or different and are  $C_1-C_6$  divalent alkyl, substituted or unsubstituted, and  $q$  and  $r$  are the same or different and are zero or 1 such that the sum of  $q$  and  $r$  is at least 1;

the substitutions in the substituted groups being selected from the group consisting of hydroxy, hydroxy(C<sub>1</sub>-C<sub>4</sub> alkyl), polyhydroxy(C<sub>1</sub>-C<sub>4</sub> alkyl), and alkanoamido;

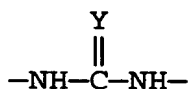
R<sup>2</sup> is a member selected from the group consisting of β1,3Gal, α1,2Man, α1,6GalNAc and β1,3Galβ1,4Glc; p is zero or 1; and X is the linker moiety.

47. A composition of claim 46, wherein the linker moiety has the formula:



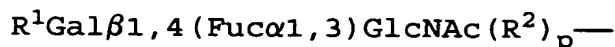
wherein, n and m are the same or different and are integers from 2 to 12; Y is O or S; and W is O, S, or NH.

48. A composition of claim 46, wherein the linker moiety is 5- to 14-membered ring having two substituents, each substituent having the formula



wherein, Y is O or S; and the substituents being in a cis- or trans-relationship.

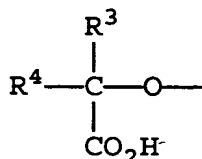
49. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a heterocyclic compound having two nitrogen atoms and two selectin-binding moieties, each moiety being linked to one of the nitrogen atoms and having the formula:



in which:

*Claims*  
46-48  
8/10/76

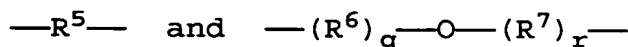
$R^1$  is a member selected from the group consisting of an oligosaccharide and a group having the formula



in which:

$R^3$  and  $R^4$  taken individually are the same or different and are selected from the group consisting of H,  $C_1$ - $C_8$  alkyl, hydroxy- ( $C_1$ - $C_8$  alkyl), aryl- ( $C_1$ - $C_8$  alkyl), and ( $C_1$ - $C_8$  alkoxy)- ( $C_1$ - $C_8$  alkyl), substituted or unsubstituted, or

$R^3$  and  $R^4$  form a single radical which is a member selected from the group consisting of



in which  $R^5$  is  $C_3$ - $C_7$  divalent alkyl, substituted or unsubstituted,  $R^6$  and  $R^7$  are the same or different and are  $C_1$ - $C_6$  divalent alkyl, substituted or unsubstituted, and  $q$  and  $r$  are the same or different and are zero or 1 such that the sum of  $q$  and  $r$  is at least 1;

the substitutions in the substituted groups being selected from the group consisting of hydroxy, hydroxy( $C_1$ - $C_4$  alkyl), polyhydroxy( $C_1$ - $C_4$  alkyl), and alkanoamido;

$R^2$  is a member selected from the group consisting of  $\beta 1,3$ Gal,  $\alpha 1,2$ Man,  $\alpha 1,6$ GalNAc and  $\beta 1,3$ Gal $\beta 1,4$ Glc; and

$p$  is zero or 1.

50. A composition of claim 49, wherein the heterocyclic compound is piperazine or homopiperazine.

Claim 49  
870, 784

51. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and an amino acid linked to a selectin-binding oligosaccharide moiety selected from the group consisting of

NeuAc $\alpha$ 2,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R)<sub>a</sub>-,

NeuGc $\alpha$ 2,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R)<sub>a</sub>-, and

NeuGc $\alpha$ 2,3Gal $\beta$ 1,4GlcNAc $\beta$ 1,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R)<sub>a</sub>-;

wherein R is a member selected from the group consisting of  $\beta$ 1,3Gal,  $\alpha$ 1,2Man,  $\alpha$ 1,6GalNAc and  $\beta$ 1,3Gal $\beta$ 1,4Glc; and

a is zero or 1.

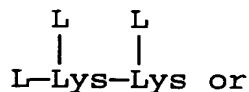
52. A composition of claim 51, wherein the amino acid is lysine, homolysine, ornithine, diaminobutyric acid, asparagine or diaminopropionic acid.

53. A composition of claim 51, wherein the amino acid is incorporated into an oligopeptide.

54. A composition of claim 53, wherein the oligopeptide comprises one or more of the following: lysine, homolysine, ornithine, diaminobutyric acid, asparagine or diaminopropionic acid.

55. A composition of claim 54, wherein the oligopeptide further comprises one or more of the following: alanine, tyrosine or radioiodinated tyrosine.

56. A composition of claim 53, wherein the oligopeptide comprises, in a direction from the N-terminus to the C-terminus,



wherein  $R_1$  and  $R_2$  are the same or different and are any amino acid residue and L is the oligosaccharide moiety.

57. A pharmaceutical composition for treating an inflammatory condition, the composition comprising a pharmaceutically acceptable carrier and an immunoglobulin capable of selectively binding an oligosaccharide ligand recognized by a selectin cell surface receptor, the immunoglobulin being present in an amount sufficient to treat the condition.

58. A composition of claim 57, wherein the ligand is selected from the group consisting of

NeuAc $\alpha$ 2,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R) $_a$ -,

NeuGc $\alpha$ 2,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R) $_a$ -, and

NeuGc $\alpha$ 2,3Gal $\beta$ 1,4GlcNAc $\beta$ 1,3Gal $\beta$ 1,4(Fuc $\alpha$ 1,3)GlcNAc-(R) $_a$ -;

wherein R is a member selected from the group consisting of  $\beta$ 1,3Gal,  $\alpha$ 1,2Man,  $\alpha$ 1,6GalNAc and  $\beta$ 1,3Gal $\beta$ 1,4Glc; and

a is zero or 1.

59. A composition of claim 57, wherein the oligosaccharide moiety is expressed by a leukocyte.

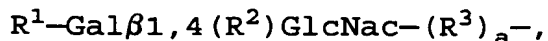
60. A composition of claim 57, wherein the selectin receptor is expressed by a vascular endothelial cell or a platelet.

61. A composition of claim 57, wherein the selectin receptor is E-Selectin or P-Selectin.

62. A composition of claim 57, wherein the composition is in unit dosage form.

63. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound comprising a

moiety which selectively binds a selectin receptor, the moiety having the formula:



wherein  $R^1$  is NeuAc $\alpha$ 2,3, NeuGc $\alpha$ 2,3, NeuAc $\alpha$ 2,3,  
Gal $\beta$ 1,4GlcNAc $\beta$ 1,3, or NeuGc $\alpha$ 2,3Gal $\beta$ 1,4GlcNAc $\beta$ 1,3;  
wherein  $R^2$  is Fuc $\alpha$ 1,3, Ara $\alpha$ 1,3, (R,S)-5-alkyl-Ara $\alpha$ 1,3  
and (R,S)-5-aryl-Ara $\alpha$ 1,3; and  
wherein  $R^3$  is 1,3 $\beta$ Gal, 1,2 $\alpha$ Man, or 1,6 $\alpha$ GalNAc and a is  
0 or 1.

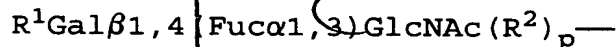
64. A composition of claim 63, wherein the compound is a biomolecule.

65. A composition of claim 63, wherein the moiety binds a selectin receptor expressed on a vascular endothelial cell or a platelet.

66. A composition of claim 63, wherein the selectin receptor is E-Selectin or P-Selectin.

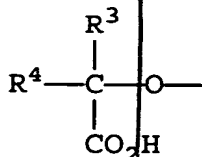
67. A method for inhibiting selectin-mediated intercellular adhesion in a patient, the method comprising administering to the patient a therapeutically effective dose of a pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound which selectively binds a selectin receptor.

68. A method of claim 67, wherein the compound comprises a moiety which selectively binds a selectin receptor, the moiety having the formula:



in which:

$R^1$  is a member selected from the group consisting of an oligosaccharide and a group having the formula



in which:

$R^3$  and  $R^4$  taken individually are the same or different and are selected from the group consisting of H,  $C_1$ - $C_8$  alkyl, hydroxy- ( $C_1$ - $C_8$  alkyl), aryl- ( $C_1$ - $C_8$  alkyl), and ( $C_1$ - $C_8$  alkoxy)- ( $C_1$ - $C_8$  alkyl), substituted or unsubstituted, or

$R^3$  and  $R^4$  form a single radical which is a member selected from the group consisting of  $-R^5-$  and  $-(R^6)_q-O-(R^7)_r-$  in which  $R^5$  is  $C_3$ - $C_7$  divalent alkyl, substituted or unsubstituted,  $R^6$  and  $R^7$  are the same or different and are  $C_1$ - $C_6$  divalent alkyl, substituted or unsubstituted, and  $q$  and  $r$  are the same or different and are zero or 1 such that the sum of  $q$  and  $r$  is at least 1; the substitutions in the substituted groups being selected from the group consisting of hydroxy, hydroxy( $C_1$ - $C_4$  alkyl), polyhydroxy( $C_1$ - $C_4$  alkyl), and alkanoamido;

$R^2$  is a member selected from the group consisting of  $\beta 1,3Gal$ ,  $\alpha 1,2Man$ ,  $\alpha 1,6GalNAc$  and  $\beta 1,3Gal\beta 1,4Glc$ ; and  $p$  is zero or 1.

69. A method of claim 67, wherein the compound is a biomolecule.

70. A method of claim 67, wherein the intercellular adhesion is associated with an inflammatory condition.

71. A method of claim 70, wherein the inflammatory condition is septic shock.

Claims  
68-70  
81, 9, 789

Claims  
71-77  
8/9/89  
5  
72. A method of claim 70, wherein the inflammatory condition is acute respiratory distress syndrome or wound associated sepsis.

73. A method of claim 67, wherein the intercellular adhesion is associated with metastasis.

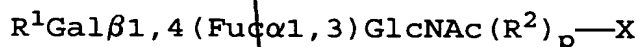
74. A method of claim 67, wherein the selectin receptor mediates adhesion of a leukocyte, monocyte or neutrophil to an endothelial cell.

75. A method of claim 67, wherein the selectin receptor is E-Selectin or P-Selectin.

76. A method of claim 67, wherein the compound is embedded in a liposome.

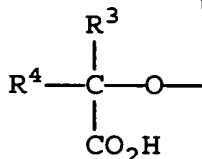
77. A method of claim 67, the compound is a polysaccharide.

78. A method of treating an inflammatory disease process mediated by a selectin receptor in a patient, the method comprising administering to the patient a therapeutically effective dose of a compound which selectively binds the receptor, the compound having the formula:



in which:

$R^1$  is a member selected from the group consisting of an oligosaccharide and a group having the formula



in which:

$R^3$  and  $R^4$  taken individually are the same or different and are selected from the group consisting of H,  $C_1$ - $C_8$  alkyl,



hydroxy- (C<sub>1</sub>-C<sub>8</sub> alkyl), aryl-  
(C<sub>1</sub>-C<sub>8</sub> alkyl), and (C<sub>1</sub>-C<sub>8</sub> alkoxy)-  
(C<sub>1</sub>-C<sub>8</sub> alkyl), substituted or  
unsubstituted, or

R<sup>3</sup> and R<sup>4</sup> form a single radical which is a  
member selected from the group  
consisting of  
—R<sup>5</sup>— and —(R<sup>6</sup>)<sub>q</sub>—O—(R<sup>7</sup>)<sub>r</sub>—  
in which R<sup>5</sup> is C<sub>3</sub>-C<sub>7</sub> divalent alkyl,  
substituted or unsubstituted, R<sup>6</sup> and R<sup>7</sup>  
are the same or different and are C<sub>1</sub>-C<sub>6</sub>  
divalent alkyl, substituted or  
unsubstituted, and q and r are the same  
or different and are zero or 1 such  
that the sum of q and r is at least 1;  
the substitutions in the substituted groups  
being selected from the group  
consisting of hydroxy, hydroxy(C<sub>1</sub>-C<sub>4</sub>  
alkyl), polyhydroxy(C<sub>1</sub>-C<sub>4</sub> alkyl), and  
alkanamido;

R<sup>2</sup> is a member selected from the group consisting of  
β1,3Gal, α1,2Man, α1,6GalNAc and β1,3Galβ1,4Glc;  
p is zero or 1; and  
X is a biomolecule.

79. A method of claim 78, wherein X is an  
oligosaccharide, an oligopeptide, a protein, or a lipid.

80. A method of claim 78, wherein the selectin  
receptor is E-Selectin or P-Selectin.

81. A method of assaying a test compound for the  
ability to inhibit selectin-mediated cellular adhesion, the  
method comprising the steps of:

contacting the test compound with a selectin  
receptor and an isolated selectin-binding agent; and  
detecting the ability of the test compound to  
inhibit binding between the receptor and the agent.

25  
78, 79, 80, 81  
40, 78

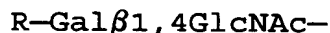
claims  
81-89  
810, 189  
5  
82. A method of claim 81, wherein the agent comprises an SLe<sup>x</sup> moiety, or an SLe<sup>x</sup> mimetic.

83. A method of claim 81, wherein the receptor or the agent are immobilized on a solid surface.

84. A method of claim 81, wherein the test compound is an oligosaccharide or a glycoconjugate.

10 85. A pharmaceutical composition comprising a compound capable of blocking selectin-mediated cellular adhesion, the compound being identified by the method of claim 81.

15 86. A method for preparing a compound comprising an oligosaccharide moiety capable of selectively binding a selectin receptor, the method comprising fucosylating a polysaccharide comprising a sequence having the formula:



20 wherein R is a sialic acid.

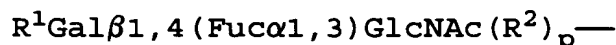
87. A method of claim 86, wherein the step of fucosylating is carried out using an  $\alpha 1,3$  fucosyltransferase.

25 88. A method of claim 86, wherein the polysaccharide is a type Ia polysaccharide of Group B streptococcus.

30 89. A method of claim 86, wherein the polysaccharide is a type II or type III polysaccharide of Group B streptococcus.

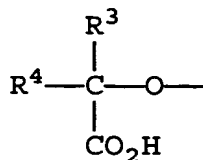
35 90. A method for preparing a compound comprising a plurality of moieties capable of selectively binding a selectin receptor, the method comprising linking the moieties together using a linker moiety.

91. A method of claim 90, wherein the selectin receptor-binding moieties have the formula:



in which:

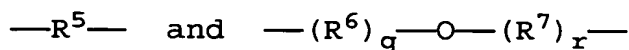
$R^1$  is a member selected from the group consisting of an oligosaccharide and a group having the formula



in which:

$R^3$  and  $R^4$  taken individually are the same or different and are selected from the group consisting of H,  $C_1$ - $C_8$  alkyl, hydroxy- ( $C_1$ - $C_8$  alkyl), aryl- ( $C_1$ - $C_8$  alkyl), and ( $C_1$ - $C_8$  alkoxy)- ( $C_1$ - $C_8$  alkyl), substituted or unsubstituted, or

$R^3$  and  $R^4$  form a single radical which is a member selected from the group consisting of

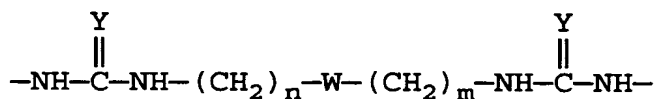
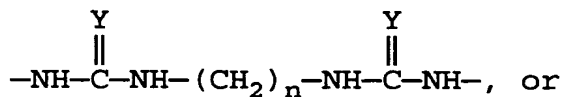


in which  $R^5$  is  $C_3$ - $C_7$  divalent alkyl, substituted or unsubstituted,  $R^6$  and  $R^7$  are the same or different and are  $C_1$ - $C_6$  divalent alkyl, substituted or unsubstituted, and  $q$  and  $r$  are the same or different and are zero or 1 such that the sum of  $q$  and  $r$  is at least 1; the substitutions in the substituted groups being selected from the group consisting of hydroxy, hydroxy( $C_1$ - $C_4$  alkyl), polyhydroxy( $C_1$ - $C_4$  alkyl), and alkanoamido;

$R^2$  is a member selected from the group consisting of  $\beta 1,3\text{Gal}$ ,  $\alpha 1,2\text{Man}$ ,  $\alpha 1,6\text{GalNAc}$  and  $\beta 1,3\text{Gal}\beta 1,4\text{Glc}$ ; and  $p$  is zero or 1.

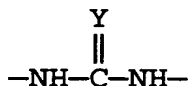
claim 90  
8/10/78

92. A method of claim 90, wherein the linker moiety has the formula:



wherein, n and m are the same or different and are integers from 2 to 12; Y is O or S; and W is O, S, or NH.

93. A method of claim 90, wherein the linker moiety is 5- to 14-membered ring having two substituents, each substituent having the formula



wherein, Y is O or S; and the substituents being in a cis- or trans-relationship.

94. A method of claim 90, wherein the substituents are in a 1,2 to 1, (p/2)+1 arrangement, wherein p is an integer from 5 to 14 and corresponds to the size of the ring.

add  
d' >  
B6

Instant c/s 1-44 = 810,789 c/s 1-44  
45 = nothing  
46-94 = 45-93